



PATENT

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 10/609,167

Attorney Docket: DP-308578

Filing Date: 06/27/2003

Applicant: John B. Hageman et al.

Group Art Unit: 3683

Examiner: Schwartz, Christopher P.

Title: HEAT DISSIPATION FOR AN ELECTRIC BRAKE ASSEMBLY

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

AMENDMENT

Sir:

In response to the Office Action mailed February 23, 2005, please consider the Remarks herein.

REMARKS*Claim Rejections under Section 103*

Claims 1, 6, 8, and 10 were rejected under 35 U.S.C. § 103 as unpatentable over United States Patent No. 5,394,963, issued to Deane et al. in 1995, in view of United States Patent No. 6,367,592, issued to Kapaan et al. in 2002. Claims 9 and 13 were rejected under 35 U.S.C. § 103 as unpatentable over Deane et al. in view of Kapaan et al. and further in view of United States Patent No. 4,014,410, issued to Bryant in 1977.

Deane et al. describes a hydraulic braking system, i.e., a system using hydraulic fluid to urge a friction pad against a rotor, col. 2, lines 59-64, and circulates coolant through a coolant passage 12 in the caliper body to dissipate heat generated by the friction pad, col. 2, line 67, to col. 4, line 1. Applicants' assembly is actuated by an electric motor, as opposed to a hydraulic actuator in Deane et al. Moreover, Applicants' invention comprises a heat pipe, as opposed to circulating coolant as in Deane et al. Still further, the heat pipe in Applicants' invention is connected to the stator of the electric motor and dissipates heat generated by the motor, as opposed to frictional heat created by the pad against the rotor. Deane et al. provides a hydraulic system and so is not concerned with excessive heat in an electric motor. Thus, nothing in Deane et al. would lead the practitioner to a heat pipe connected to the stator of an electric motor to improve brake assembly performance. Without this, Deane et al. cannot suggest Applicants' invention.

The rejection relies upon Kapaan et al. to show substitution of an electric motor for a hydraulic system in a brake assembly. However, Kapaan et al. does not show a heat pipe connected to the stator to dissipate heat generated by the electric motor. Thus, Kapaan et al., like Deane et al., does not show Applicants' invention.

Bryant is applied to show fins 206 or a radiator 210 for cooling hydraulic fluid in a hydraulic brake system. Bryant does not show an electric motor, does not concern heat generated by such electric motor, does not disclose a heat pipe, and so cannot show Applicants' invention that connects the stator of an electric motor in an electric brake assembly to a heat pipe to dissipate heat generated by the motor.

The rejection acknowledges that Deane et al. describes a hydraulic actuator, and not an electric motor. However, Kapaan et al. and Bryant do not make up the deficiencies. None of the references disclose a heat pipe. None of the references connect a heat pipe to a stator of an electric motor. None of the references dissipate heat from an electric motor to improve operation of a brake assembly. Even if combined, there is nothing in the references to lead the practitioner to Applicants' invention for dissipating heat from an electric motor of a brake assembly by a heat pipe connected to the stator.

Claim 1 is directed to Applicants' brake assembly that includes a rotor and a friction pad, and also includes a brake caliper assembly comprising an electric actuator motor operable to force the friction pad into frictional engagement with the rotor. Further, the claim recites that the electric actuator motor having a stator and calls for a

heat pipe connected to the stator of the motor to dissipate heat generated by the motor. Deane et al. shows a hydraulic brake assembly and cools the brake caliper to dissipate frictional heat. Even if modified to include an electric actuator motor, per Kapaan et al., there is nothing in the references to lead the practitioner to connect a heat pipe to the stator. Thus, the references do not show Applicants' brake assembly in claim 1.

Claims 6 and 8-9 are dependent upon claim 1, and are not taught by Deane et al. and the secondary references at least for the reasons set forth with regard to that claim.

Claim 10 is directed to the method of Applicants' invention for dissipating heat from a brake assembly. Like claim 1, claim 10 calls for a heat pipe connected to a stator of an electric actuator motor. For the reasons herein, Deane et al., even with the proposed modifications of Kapaan et al. and Bryant, does not show a heat pipe connected to a stator in a brake assembly. Thus, the references do not suggest Applicants' method in claim 10, or in claim 13 dependent thereon.

Accordingly, it is respectfully requested that the rejection of the claims based upon Deane et al., either alone or in combination with Kapaan et al. or Bryant, be reconsidered and withdrawn, and that the claims be allowed.

Conclusion

It is believed, in view of the amendments and remarks herein, that all grounds of rejection of the claims have been addressed and overcome, and that all claims are in condition for allowance. If it would further prosecution of the application, the Examiner is urged to contact the undersigned at the phone number provided.

The Commissioner is hereby authorized to charge any fees associated with this communication to Deposit Account No. 50-0831.

Respectfully submitted,



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